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SOURCES AND EFFECTS OF ACCURATE WORK PERCEPTIONS

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)
Perceptions of instrumentalities and expectancies used to index work motivation in Expectancy theory were investigated in a sample of 58 engineers in a manufacturing organization. Instrumentalities and expectancies of focal engineers were compared to those of their supervisor and two sets of peers nominated by the focal engineer. The results showed that the focal engineers' perceptions of the rewards associated with performance agreed closely with those of chosen peers. However, for supervisors, the agreement was high for new engineers but diverged
(continued)

from the supervisors as the focals gained more experience on the job. The implications of this and other findings were discussed in light of their effects on supervisory and organizational attempts to influence performance through motivation. This report is sixth in a series entitled "Sources and Effects of Accurate Work Perceptions."

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Sources and Effects of Accurate Work Perceptions

The assumption that the individual is influenced by his beliefs about the situation in which he finds himself and his beliefs about the consequences of his actions is new neither to psychologists nor to students of individual behavior in organizational settings. For example, both Lewin (1938) and Tolman (1932) emphasized the role of a behavior and its perceived outcome in the early 1930's. In the middle to the late 1960's, motivational theories with concepts similar to those of Lewin and Tolman began to appear among those concerned with the behavior of individuals in organization (see for example, Porter & Lawler, 1968; Vroom, 1964). In all cases, motivation was viewed as the result of some cognitive processing of information about the consequences of various behavioral alternatives.

Cognitive variables play a central role in a large body of research and theory dealing with work motivation known as Expectancy Theory. Although expectancy theory has its roots in the early theories of Tolman (1932) and Lewin (1938) and the later works of Edwards (1954), Peak (1955), and Rotter (1955), the use of the theory for understanding work behavior in organizations was stimulated by the relatively recent goal-path approach of Georgopolous, Mahoney and Jones (1957), Vroom's (1964) instrumentality theory, and Porter and Lawler's (1967) expectancy theory. Recently, several studies have demonstrated the usefulness of expectancy theory for the understanding of work behavior in ongoing organizations and simulated organizations (see Mitchell, 1974, for a thorough review).

The value of expectancy theory lies in its view of motivation as a function of both characteristics of the individual and characteristics of the environment in which the individual finds himself. However, although the theory purports to incorporate the interaction between situational and individual variables, it only uses an individual's <u>perceptions</u> of the situational variables as a measure of the actual situation. Generalizations can be made to the situation per se only if we are willing to assume that workers' perceptions mirror the objective environment on all or most of the factors in the job environment which are relevant to job behaviors. Such an assumption is, at best, risky. Lawler (1967), for example, showed that large discrepancies existed between organizational members' perceptions of pay policies and the actual policy. Hackman and Lawler (1971) found little agreement among subordinates, their supervisors, and raters who were members of the research team on the amount of performance feedback telephone company employees received about their own performance. Hackman and Oldham (1975) report similar discrepancies. Few would disagree that pay and performance feedback are relevant job dimensions for the motivation of job incumbents. Therefore, determination of the conditions which influence perceptions of these and other relevant job dimensions is necessary if we are to be able to make statements about the relationships between job characteristics and job behavior.

The relative lack of attention paid to the sources of job perceptions should not imply that knowledge about their source is trivial or unimportant. It would be trivial only if perceptions of the situation mirrored the actual situation. The data of Lawler (1967), Hackman and Lawler (1971), and Hackman and Oldham (1975), clearly showed that this was not the case. Hackman's discussion of how workers "redefine" the job also implied the necessity to understand job characteristics which influence this redefinition (Hackman, 1969, 1970; Hackman & Lawler, 1971). Hackman (1969) pointed out that the worker responds to his redefinition of the job and <u>not</u> to the actual job. To what extent does the redefinition of job characteristics agree with actual job characteristics? What factors influence the similarities and dissimilarities?

Does the redefinition become more or less similar to the actual job over time? Little information exists to answer these questions.

The issue of perceptual vs. situational measures currently is being discussed in reference to organizational climate (Schneider, 1975). Guion (1973) warned against the tautological nature of research purporting to show a relationship between climate and job attitudes when both the measures are obtained from the same individual. Guion correctly pointed out that, unless some measures of climate are obtained independent of the individual's whose attitudes are of interest, little or nothing can be concluded about the effect of climate. Schneider (1973), on the other hand, stressed that organizational climate influences attitudes and behaviors only through the individual's perceptions of that climate; therefore, he urged that the use of perceptual measures be continued. Guion and others (e.g., Herman, 1973) who have taken issue with the perceptual measures of organizational climate, would not disagree with the general model of behavior or attitudes which states that both are functions of the way the individual perceives his environment rather than the "actual" environment. They do take issue with the utility of the perceptual approach for the understanding of behavior and attitudes (Herman, 1973) and with the tendency to lapse into a discussion of the perceptual measures <u>as if</u> they were independent measures of situational characteristics (Guion, 1973). Clearly, if organizational climate is to be anything but, "one of the fuzziest concepts to come along in some time," (Guion, 1973, p. 121) measures of perceived organizational climate must be related to independent measures of attributes of the work environment. Schneider's recent conceptualization of climate retains the perceptual nature of it but recognizes the need for external referents (Schnieder, 1975). Thus, the problem faced by researchers of perceived organizational climate is exactly the same as those faced by

Expectancy Theory; situational and individual contributions to the job perceptions must be understood.

The present research was undertaken to explore the sources of work perceptions relevant to Expectancy theory and to investigate the effects of the accuracy of these and other perceptions on behaviors and attitudes. The work setting perceptions of interest were expectancies and instrumentalities as defined by the theory. Expectancies are the perceived relationships between the levels of effort exerted by an individual on his job and the levels of performance he feels he will attain as a result of this effort. Instrumentalities are the perceived association between levels of performance and outcomes which may or may not result from performance. Both of these terms are the individual's representation of his work-performance environment and his place in it.

To obtain an index of Motivational Force on the degree to which the individual should desire to put forth effort in the work setting, the theory introduces a final concept which is more individualistic and less tied to the immediate work environment--valence of outcomes. The valence of an outcome is the anticipated satisfaction the individual expects from an outcome (Vroom, 1964). Combining expectancies, instrumentalities, and valences as follows provides an index of Motivational Force.

$$\text{Motivational Force} = E \sum_{i=1}^{n} I_i V_i \text{ where}$$

E = the expectancy that effort will lead to performance.

I_i = the instrumentality of performance for the attainment of outcome i.

V_i = the valence of outcome i.

n = the set of outcomes under consideration.

The exact operational definitions of these variables will be addressed in the Method section.

Two classes of sources of the work setting perceptions, expectancies, and instrumentalities, were explored. The first set included individual difference characteristics. Previous research has demonstrated that both personality variables (Leid and Pritchard, in press) and the amount of experience on the job (Dachler and Mobley, 1973) influence expectancies and instrumentalities. Second, interpersonal sources were explored: specifically supervisors and co-workers. It was assumed that these individuals comprised a major portion of the individual's role set (Katz and Kahn, 1966) and would be expected to send to the individuals information about expectancies and instrumentalities.

Method

Sample

The study was conducted on members of an engineering force in a medium sized manufacturing industry located in the Midwest. The focal engineers were engaged primarily in engineering tasks rather than supervising other engineers. The sample included several types of engineers (electrical, industrial, mechanical, etc.), but they divided into two major classes. By far the more numerous were "process" engineers--those whose jobs involved designing new manufacturing processes and/or redesigning old processes. The remainder were "product development" engineers. As the name implies, they were concerned with the development of new products. The two classes were combined for the purposes of this study because of the small number of product development engineers and because of the fact that there did not seem to be a major difference between the groups on the variables of interest to this investigation.

Of the 80 engineers eligible to participate in the study, 58 responded. These 58 engineers were asked to give the names of fellow engineers (hereafter referred to as peers) to whom they went for answers to questions about their job and with whom they interacted informally (e.g., with whom they ate lunch). Also, their supervisors were asked to describe the engineering jobs of those under them and to rate the performance of each of their engineers. Data from other engineers and from supervisors were not available for all 58 participants in the study. Therefore, results which require responses from peers and/or supervisors are based upon less than 58 people.

Procedure

Engineers reported to a conference room in groups of no more than eight persons during a two day period. At this time, the researchers explained the general purpose of the study, told what would be done with the data, and insured the participants that their individual responses would be kept confidential by the Purdue staff. They were also told that participation was voluntary and that they could decide at any time not to participate in the study. One person did take this option after looking at the questionnaire. Finally, questionnaires were distributed, and participants took approximately one hour to complete them. Engineers and supervisors who could not be scheduled during the two days of data collection completed questionnaires on their own time and mailed them directly to Purdue.

The model of motivation used has been termed the Expectancy Model (Mitchell, 1974). It assumes motivation is a function of three components. The first is the individual's expectancy that if he puts forth a given level of effort, he will reach a given level of performance. In other words, it is the connection he sees between the effort he puts out and the level of performance he will obtain on the job. If he sees a good connection, he should be more willing to work hard than if, no matter how hard he works, he believes his performance level will be the same. To measure expectancies, the engineers were asked to state the probability that a given level of effort (either high, average, or low) would lead to a given level of performance (again high, average, or low). Thus, nine subjective probabilities were obtained, one for each of the possible effort-to-performance level pairs (high effort leads to high performance, high effort leads to average performance, high effort leads to low performance, average effort leads to high performance, etc.).

Next, valence measures were obtained. A list of twenty-four outcomes (both positive and negative) were generated based upon typical rewards used in organizational research and upon interviews with the engineers. Ratings were obtained for each outcome on the degree to which each was desirable or undesirable to them. To increase the reliability of these ratings, the twenty-four items were clustered into nine more general items. Figure 1 lists these clusters, the items that comprised them, and the internal consistency reliability based upon coefficient alpha for each cluster. Although the clustering produced higher reliabilities than the typical expectancy theory procedure of using a single item, the obtained reliabilities for clusters still were not high.

The degree of association between rewards and performance was based upon subjective probabilities that a given level of performance led to a given reward. This measure was much the same as the expectancy measure. However, for instrumentalities, each level of performance was associated with a reward, such as high pay, and not three levels of pay. As with valences, composite scores were formed for the nine reward categories.

Figure 1. Job Outcomes Used in the Study

<u>Outcomes</u>

A. PAY (Coefficient Alpha = .68)

1. Earn enough money to be able to afford non-essentials on occasion without worrying about their cost.
2. Receiving a salary increase for doing a good job.
3. Earn a good living.
4. Earn enough just to get by each month.

B. AUTONOMY (Coefficient Alpha = .70)

1. A high degree of freedom to set work prioriti[illegible] you see fit.
2. Being able to set or extend within reason dead[illegible]es for completion of projects for which you are responsible.
3. Having your work schedule set up primarily by your supervisor.
4. Having little or no say about which projects are assigned to you.

C. SECURITY (Coefficient Alpha = .34)

1. Worry about losing your job.
2. Feeling that your job is very secure.

D. RECOGNITION (Coefficient Alpha = .27)

1. Receiving awards, letters, praise or other honors from the company for doing a good job.
2. Receiving a salary increase for doing a good job.

E. PROMOTION (Coefficient Alpha = .45)

1. Rapid promotion within the company.
2. Remain in your position for several years before being considered for a major promotion.

F. FRIENDSHIP (Coefficient Alpha = .59)

1. Developing close friendships with other engineers in your work unit.
2. Developing a close friendship with your supervisor.

G. FEEDBACK (Coefficient Alpha = .49)

1. Receiving criticism from your supervisor.
2. Receiving complaints from people using some machine, procedure, or system which you designed or planned.
3. Having your supervisor tell you he is very satisfied with your performance.

Figure 1

(Continued)

H. ACCOMPLISHMENT (Coefficient Alpha = .16)

1. Overcoming especially difficult technical problems on a project assigned to you.
2. Feeling little sense of accomplishment.

I. JOB DEMANDS ON TIME (Coefficient Alpha = .63)

1. Working long hours--weekends and evenings.
2. Often thinking about your job when you are home.
3. Usually being able to put your family ahead of work demands.

Finally, the model views motivation as equal to the expectancy that effort will lead to performance multiplied by the extent to which performance leads to rewards. Symbolically this becomes:

$$\text{Motivation} = E \sum_{i=1}^{9} I_i V_i) \text{ where}$$

E = the expectancy that effort leads to performance

I_i = the instrumentality of performance for attainment of reward i,

and V_i = the desirability of reward i to the individual.

Although a large body of literature exists on this view of motivation (see Mitchell, 1974 for a review), there are still many questions as to what is the best way to measure the Es and the Is. The method chosen here was to subtract two probabilities to estimate E and I_i. In the case of the expectancy measure, the reported probability that low effort would lead to high performance was subtracted from the probability that high effort would lead to high performance. It was reasoned that if the person saw a large difference between the two, he should see a connection between effort and performance. On the other hand, if little difference existed, he should not alter his behavior because it would have little effect on his judged performance. For example, if someone saw a .9 probability that if he put forth high effort, he would be a high performer, but also saw a .9 probability that low effort would lead to high performance, in this setting, he should conserve his energy and not put in high effort. If, on the other hand, low effort had only a .1 probability of leading to high performance, he should put forth effort if he desires to be a high performer (see Ilgen and Peters, 1975, for a more complete discussion of this rationale and data to support it). Therefore, motivation was defined as:

$$\text{Motivation of person}_j = \left(P_{\substack{\text{high effort}\\ \text{leads to high}\\ \text{performance}}} - P_{\substack{\text{low effort}\\ \text{leads to high}\\ \text{performance}}}\right) \left[\sum_{i=1}^{9} \left(P_{\substack{\text{high perf}\\ \text{leads to}\\ \text{reward}_i}} - P_{\substack{\text{low perf}\\ \text{leads to}\\ \text{reward}_i}}\ {}_iV_i\right)\right]$$

Job Descriptions

The engineers were asked to describe the extent to which they performed certain behaviors in their job and/or certain factors were present in their job. These job descriptions were based upon extensive interviews with engineers in order to develop a list of job facets which covered most of the jobs and which described jobs in terms the engineers were accustomed to using. Figure 2 contains a list of the job description items. It shows that the items were classified in two ways. The first dealt strictly with job duties. The second involved aspects of the job not related to specific duties or behaviors, but comprising elements of Hackman and Oldham's (1974) motivational potential concept. Although the items do not sample their components of motivational potential completely, it was felt that the items do tap many of the essential characteristics of motivational potential.

Peer Nominations and Discrepancy Scores: The engineers were asked to nominate two sets of peers with from one to three peers in each set. The first, termed the technical peer, was that individual(s) to whom he went for technical advice. The only restrictions placed upon the engineer's selection of this person (or persons) was that he (or they) could not be his supervisor and had to be members of his immediate work group. For the second peer, the social peer, the engineer selected a member (or members) of his immediate work group, excluding his supervisor, with whom he frequently interacted socially, e.g., with whom he took coffee breaks, ate lunch, etc.

Identical Job Description items were filled out by the nominated peers as well as the focal engineer's supervisor. In cases for which more than

Figure 2: Job Description Items Categorized According to Job Duties and Motivating Potential

ITEMS	CLASSIFICATION Job Duties	CLASSIFICATION Motivating Potential
1. Basically, an engineer in this job spends much of his time planning the best use of equipment and materials.	X	
2. Engineers on this job investigate problems of a basic and fundamental nature which may not be undertaken for specific practical application.		X
3. It is important for engineers in this job to keep informed about competitive products and activities.	X	
4. Simplifying production methods is an important aspect of this engineering job.	X	
5. Supervisors recognize a good engineering job and will congratulate you for a good job.		X
6. Close personal friendships develop between engineers.		X
7. Engineers on this job develop working models (prototypes) of new instruments or processes.	X	
8. For the most part, engineers on this job are well aware of how well they are doing on their job.		X
9. Performing liaison work with departments and personnel to maintain overall efficiency of process or equipment production is an essential duty for engineers on this job.	X	
10. In this position, engineers prepare initial specifications for equipment installation.	X	
11. Supervisors will furnish technical assistance on especially difficult engineering problems.		X
12. Engineers in this position evaluate performance of present materials, designs, methods, processes, products, equipment.	X	
13. Selling ideas to people is an essential skill for engineers holding this job.	X	
14. Engineers on this job are allowed to arrange their work priorities with minimum interference from their supervisor.		X
15. Overall, an engineer in this position can earn as much or more than a person with comparable qualifications in another organization.		X

Figure 2 (Continued)

ITEMS	CLASSIFICATION Job Duties	Motivating Potential
16. Engineers set up pilot projects to develop and test new processes and equipment designs.	X	
17. Planning the best use of personnel is an aspect of this engineering position.	X	
18. Engineers on this job work with customers' representatives to suggest equipment and process modification.	X	
19. Engineers on this job often are to develop original technical ideas.		X
20. Engineers on this job play an important role in controlling expenses.	X	
21. Preparing and making technical recommendations and proposals accounts for a great deal of the time on this particular engineering job.	X	
22. Engineers on this job attend seminars, symposia and colloquia to keep abreast of current developments.		X
23. Trouble shooting and meeting emergencies are familiar aspects of this engineering job.	X	
24. These engineers must know how to set up priorities on projects and sub-projects.	X	
25. Developing good working relationships with subordinates is crucial for engineers on this job.		X
26. Being this type of engineer often consists of tracking down materials, checking on orders and calling for supplies.	X	
27. Engineers on this job often work weekends and nights to meet deadlines.		X
28. The most competent engineers are often selected for management positions.		X
29. Engineers on this job are able to learn and improve their skill on the job.		X
30. Engineers on this job work outside the normal channels in order to insure that a project is completed according to schedule.	X	
31. Being out-of-town overnight is sometimes required of engineers on this job.		X

Figure 2 (Continued)

ITEMS	CLASSIFICATION Job Duties	CLASSIFICATION Motivating Potential
32. Engineers on this job do very routine work.		X
33. Servicing manufacturing plants is required of these engineers.	X	
34. Engineers on this job keep logs, write memos and engage in similar administrative work.	X	
35. Engineers in this job receive interesting and challenging projects.		X

one peer was nominated as a technical or social peer, the job description used for an item was the average of the responses from those nominated.

To create variables which reflected the similarity of the descriptions between the engineer and his supervisor and his self-selected peers, a D^2 statistic was used. In this case, the difference between the engineer's response to an item and the response of the other person(s) of interest was squared. The item D^2s were then summed across all items of interest to give a total discrepancy score for that category. Recall that two categories were used--Job Duties and Motivation Potential. The larger the ΣD^2 for Job Duties or for Motivation Potential between the engineer and the other person such as his supervisor, the less they agree upon the duties or motivation potential of the job.

Results

To investigate possible sources of job perceptions relevant to motivation, two sets of variables were considered. The first set contained four individual difference measures. These were: self-esteem, age in years, time in the organization in months, and time in the present position in months. The second set of variables contained the expectancy and instrumentality ratings of three other individuals or groups of individuals on the job. The three were: the immediate supervisor, peers selected by the focal person as individuals in his work group to whom he went for technical advice (Technical Peers), and peers selected on the basis of friendship (Social Peers). These three were investigated because it was assumed they would compose major components of the focal person's role set. That is, they should be the individuals on the job who would influence the focal engineer's view of his job by communicating to him either directly or indirectly what he was supposed to do on his job and the rewards associated with various role behaviors.

Table 1 presents the correlations of the individual difference measures and Expectancy and Instrumentality ratings from supervisors and peers with the same ratings from the focal engineer. Instrumentality measures for outcome $\underline{i}$ were the difference between two probabilities--the perceived probability that high performance would lead to outcome $\underline{i}$ minus the perceived probability that low performance would lead to the same outcome. Expectancy measures were a single subjective probability estimate that effort level $\underline{j}$ would lead to performance level $\underline{i}$ where effort levels were either low, average, or high and performance levels also were low, average, or high. Neither self-esteem nor age were correlated with perceptions of the contingencies of effort and outcome with performance on the job. For tenure, on the other hand, two patterns emerged. First, the longer the engineers had been with the organization, the less they believed that increases in performance led to more autonomy, recognition, a greater chance for promotion,

Table 1: Correlations Between Focal Engineers' Instrumentality and Expectancy Ratings with Individual Differences and Others' Ratings of the Same Concepts

Individual Difference Measures	INSTRUMENTALITIES OF PERFORMANCE FOR:									EXPECTANCY MEASURES: Low Effort to Performance			Ave. Effort to Performance			High Effort to Performance		
	Pay	Auton.	Sec.	Rec.	Pro.	Fdfp	Fdfb	Acc.	Time	Low	Ave.	High	Low	Ave.	High	Low	Ave.	High
Self-Esteem (N=58)	.09	.10	.05	.07	-.11	.11	.03	.08	.20	.10	.06	-.17	.22	.14	-.16	-.18	-.08	.07
Age (N=58)	.20	-.08	-.05	.01	-.14	.08	.10	.10	.18	-.09	-.01	.04	.13	-.05	-.02	.06	-.02	-.02
Time with Organization (in months) (N=58)	-.20	-.29*	-.24	-.38**	-.27*	-.50**	-.15	-.08	-.10	-.08	.04	.09	-.06	-.14	-.09	.32*	-.03	-.23
Time on Present Job (in months) (N=58)	-.18	-.21	-.26*	-.23	-.44*	-.22	-.17	-.22	.10	-.21	-.03	-.15	-.11	.00	-.5	.28*	-.11	-.38**
Others on Job																		
Supervisor (N=47)	.10	.21	.27	-.11	-.17	-.18	-.01	.28	.23	.11	-.25	-.02	-.15	-.11	.13	.05	.17	-.08
Technical Peer (N=40)	.09	-.23	.07	.09	.45**	.00	.03	-.41**	.10	-.18	.21	-.09	.33*	.08	-.14	.40**	-.15	.07
Social Peer (N=34)	.14	-.21	.28	.18	.52*	.19	.14	-.33*	.07	-.10	.27	.02	.21	-.09	-.09	-.06	-.10	-.03

or a better opportunity to form friendships with their supervisor or their co-workers. The same pattern held up for tenure in their present position for the outcome of promotion, but not for the other two. In addition, security was seen as less tied to performance. The rest of the instrumentalities were not significantly related to tenure, although the signs of all except one of the eighteen correlations were negative.

For the expectancy measures, one of the nine measures correlated with each tenure measure. The longer engineers were with the company, the more they felt low effort led to high performance. In addition, the longer they were in their present position, the less they believed high effort would lead to high performance. Although neither the correlation between tenure with the organization and high effort to high performance nor the correlation between tenure and low effort to high performance was significant at the customarily acceptable level of significance, both were marginally significant ($p \leq .10$) and were in the same direction as the significant one for the other tenure measure. Thus, it seems reasonable to conclude that, as the engineers gained more experience on the job or in the company through having put in more time, the more they believed that high performance could be attained from low effort and the less they believed that high effort would make high performance more likely.

Turning to the correlates with other individuals on the job, few significant correlations were observed. None of the correlations between the focal engineer's ratings of instrumentalities or expectancies were significantly correlated with those of his supervisors. On the other hand, two of the nine instrumentality ratings correlated significantly with those of the peers chosen by the focal engineer (see Table 1). First, all tended to agree on the instrumentality of performance for promotion. Second, the instrumentality of performance for accomplishment was negatively correlated with the peers. A negative correlation was not expected. One possible explanation is that since these peers were selected within the same work group as the focal person, there may have been something about the types of tasks within groups that led to this. For example, if performance was instrumental for feelings of accomplishment on only one or two jobs within a work group, then correlations among work group members would be negative because if one person had the job where it was high, the other by necessity would not.

Agreement between the focal engineer and his chosen peers only was observed for two expectancy measures, and this agreement occurred only with Technical Peers (see Table 1). Focal engineers' ratings of the probability that average effort and high effort would lead to low performance correlated significantly with the ratings of Technical Peers.

Although the correlational data indicated very little correspondence between the engineers and other members of their role set, these data could not detect similarities in the means of the ratings among raters. Therefore, the focal engineers' mean ratings on each of the instrumentalities and expectancies were compared to each role sender. Tables 2, 3, and 4 present these results. Table 2 shows that three of the nine subjective probabilities for expectancies as seen by the focal engineers were significantly different from those of their supervisors. In all cases, low or average performance was perceived by the engineers in comparison to their supervisors as more likely to occur, even if average or high effort were put into the job. For the other six ratings, none of the differences were significant.

Finally, the degree of agreement in the pattern of the means of Table 2 across the nine expectancies for engineers and supervisors were compared.

Table 2: Mean Comparisons of Engineers' Ratings with Their Supervisors on Expectancies and Instrumentalities

	Engineer Means	Supervisor Means	t	Significance
Expectancy that:				
Low Effort -- Low Performance	6.13	6.19	-.32	n.s.
Ave. Effort -- Low Performance	4.28	4.34	-.29	n.s.
High Effort -- Low Performance	2.53	2.11	2.00	≤ .05
Low Effort -- Ave. Performance	5.62	5.04	1.85	n.s.
Ave. Effort -- Ave. Performance	4.45	3.87	2.55	≤ .01
High Effort -- Ave. Performance	3.04	2.49	2.72	≤ .01
Low Effort -- High Performance	2.72	2.30	1.26	n.s.
Ave. Effort -- High Performance	3.77	3.62	.67	n.s.
High Effort -- High Performance	4.79	4.74	.11	n.s.
Instrumentality of Performance for:				
Pay	2.40	3.46	-4.31	≤ .01
Autonomy	2.47	2.85	-1.34	n.s.
Security	3.66	3.21	1.14	n.s.
Recognition	3.60	4.55	-3.40	≤ .01
Promotion	2.16	2.57	-1.18	n.s.
Friendships	1.77	2.06	-.90	n.s.
Feedback	3.14	3.70	-1.66	n.s.
Accomplishment	3.09	3.32	-.75	n.s.
Free time off the job	.07	-.95	2.96	≤ .01

Table 3: Mean Comparisons of Engineers' Ratings with Their Chosen Technical Peers on Expectancies and Instrumentalities (N=40)

	Focal Engineer Means	Technical Peer Means	t	p-level
Expectancy that:				
Low Effort -- Low Performance	6.23	6.02	0.68	n.s.
Ave. Effort -- Low Performance	4.28	4.42	-0.68	n.s.
High Effort -- Low Performance	2.45	2.33	0.49	n.s.
Low Effort -- Ave. Performance	5.62	5.43	0.77	n.s.
Ave. Effort -- Ave. Performance	4.45	4.72	-1.14	n.s.
High Effort -- Ave. Performance	2.98	3.02	-0.17	n.s.
Low Effort -- High Performance	2.63	2.80	-0.56	n.s.
Ave. Effort -- High Performance	3.75	3.68	0.24	n.s.
High Effort -- High Performance	4.83	4.73	0.24	n.s.
Instrumentality of Performance for:				
Pay	2.46	2.75	-1.11	n.s.
Autonomy	2.66	2.56	0.29	n.s.
Security	3.70	3.95	-0.80	n.s.
Recognition	3.52	3.81	-1.00	n.s.
Promotion	2.37	1.98	1.15	n.s.
Friendship	1.58	1.62	-0.12	n.s.
Feedback	3.13	3.57	-1.40	n.s.
Accomplishment	3.05	2.99	0.12	n.s.
Free time off the job	-.06	.23	-0.72	n.s.

Table 4: Mean Comparisons of Engineers' Ratings with Their Chosen Social Peers on Expectancies and Instrumentalities

	Focal Engineer Means	Social Peer Means	t	p-level
Expectancy that:				
Low Effort -- Low Performance	6.00	5.95	0.15	n.s.
Ave. Effort -- Low Performance	4.09	4.25	-0.70	n.s.
High Effort -- Low Performance	2.65	2.66	1.42	n.s.
Low Effort -- Ave. Performance	5.35	5.50	-0.43	n.s.
Ave. Effort -- Ave. Performance	4.38	4.51	0.45	n.s.
High Effort -- Ave. Performance	3.15	2.87	0.91	n.s.
Low Effort -- High Performance	2.29	2.5[illegible]	-0.58	n.s.
Ave. Effort -- High Performance	3.62	3.51	0.36	n.s.
High Effort -- High Performance	4.94	4.86	0.19	n.s.
Instrumentality of Performance for:				
Pay	2.36	2.61	-0.88	n.s.
Autonomy	2.48	2.14	0.81	n.s.
Security	3.51	3.60	-0.24	n.s.
Recognition	3.35	3.80	-1.40	n.s.
Promotion	2.34	2.09	0.74	n.s.
Friendships	1.78	1.69	0.62	n.s.
Feedback	2.90	3.35	-1.27	n.s.
Accomplishment	2.96	2.89	0.12	n.s.
Free time off the job	0.10	0.63	-1.14	n.s.

It was argued that, to the extent the two agreed on the order of the means, the motivational impact of the expectancies should be similar. Spearman rank order correlations (r_s) were run for the order of the mean ratings of the expectancies and instrumentalities of Table 2. The correlations between engineers and their supervisors' expectancies and instrumentalities were $r_s = .98$, $p \leq .01$ and $r_s = .77$, $p \leq .01$, respectively. Overall, they tended to see the different contingencies quite similarly. A second comparison of the expectancy means was made to the idealized pattern suggested by a motivational model. The idealized pattern was based upon the following argument. Expectancy Theory argues that the stronger the contingency between effort and performance, the greater the possible motivational impact, because the individual should see a stronger connection between his effort and his performance under a high contingency. For three levels of effort and three levels of performance, the optimal association between effort and performance is illustrated in Figure 5. Based upon nine entries with three ties for high, four ties for moderate, and two ties for low, ranks were assigned to the effort-performance contingencies and these were then correlated with the observed ranks for both engineers and supervisors. The rank order correlation for engineers with the idealized rank was $r_s = .86$ and for supervisors was $r_s = .74$. Using the index of expectancy, both saw a relatively good connection between effort and performance and no basis exists for concluding the two were different.

The instrumentality means of Table 2 indicate that engineers did not see as great a contingency between performance and the attainment of pay or recognition as did their supervisors, and they saw being a high performer as more likely to take up their free time than did their supervisors. However, the means for the latter were so low that it must be concluded that

Figure 5: Illustrated Pattern for Maximum Expectancy

Effort	Low	Average	High
High	L	M	H
Average	M	H	M
Low	H	M	L

Performance Level

KEY:

H = High Subjective Probability
M = Moderate Subjective Probability
L = Low Subjective Probability

Ranks Assigned to the Nine Cells Above

Such That: High = 2.0
Moderate = 5.5
Low = 8.5

Effort		Performance	Rank
Low	-	Low	2.0
Average	-	Low	5.5
High	-	Low	8.5
Low	-	Average	5.5
Average	-	Average	2.0
High	-	Average	5.5
Low	-	High	8.5
Average	-	High	8.5
High	-	High	2.0

neither group saw much of contingency between performance and off-the-job activities. The order of the contingencies across outcomes indicated a relatively similar pattern (r_s = .77, $p \leq .01$). Nevertheless, the discrepancy in ratings on two important outcomes, pay and recognition, may have been detrimental from a motivational standpoint to the extent that supervisors felt they were using these as rewards for good performance.

Tables 3 and 4 presented the same mean data for Technical and Social Peers. Both these indicate that the focal engineers did not differ significantly from either group on their mean ratings of expectancies and instrumentalities.

Thus far, across all engineers, the general conclusion must be reached that there was a relatively high agreement with members of the role set on what were the contingencies between effort and performance and between performance and valued outcomes. However, not differentiating among individuals may have masked the fact that some engineers may have been better at sensing their environment than others. To explore this possibility, the accuracy with which the engineers described non-motivational elements of their job environment was used to define two groups of individuals: those who were high on accuracy and those who were low. These groups were then compared on their ability to accurately rate the environmental contingencies of interest in this study.

Job perceptions unrelated to motivation were those which involved the description of specific job duties. Recall that focal engineers as well as their supervisors and chosen peers described the job on thirty-five items dealing with the job setting. A subset of these dealt with specific behaviors. For these, the focal engineer's response was subtracted from the other individual's and this difference was squared for each item, then summed over the job duty items. On the basis of these discrepancies, the top one-third and bottom one-third were identified to create two groups--a dissimilar and a similar group on their descriptions of the job duties. Within each of these groups for each role sender set, expectancies and instrumentalities were compared with correlation coefficients and t-tests for mean differences. Table 5 presents the correlational data. It is obvious from Table 5 that the degree of similarity between engineers and the other individuals did not influence their expectancy and instrumentality ratings. Comparisons of mean differences led to the same conclusion.

A second set of moderated analyses compared those high or low on tenure. Previous research implied that those who are on the job for longer periods of time hold more accurate perceptions of motivational contingencies (Dachler and Mobley, 1973). The correlational data of Tables 6 and 7 and the mean difference conparisons conducted implied just the opposite conclusion. When focal engineers were compared to their supervisors, no significant differences occurred for expectancy correlations and only one for expectancy measures. In the latter case, supervisors rated the probability that low effort would lead to high performance significantly lower than did those engineers who had been with the company more than one year ($t = 2.49$, $p \leq .05$; $\bar{X}_S = 2.03$, $\bar{X}_E = 2.62$).

The greatest discrepancy occurred among instrumentality perceptions. Although none of the correlations were significantly different, the mean rating from supervisors differed from engineers who had been with the company for more than one year on six of the nine outcomes. These were: pay ($t = -3.88$, $p \leq .01$; $\bar{X}_s = 3.36$, $\bar{X}_E = 2.14$), Autonomy ($t = -2.39$, $p \leq .05$; $\bar{X}_S = 2.90$, $\bar{X}_E = 2.07$), Recognition ($t = -4.66$, $p \leq .01$; $\bar{X}_S = 4.57$, $\bar{X}_E = 3.11$), Promotion ($t = -2.37$, $p \leq .05$; $\bar{X}_s = 2.64$, $\bar{X}_E = 1.55$), Feedback ($t = -2.42$, $p \leq .05$;

Table 5: Correlations Between Focal Engineers and Their Supervisors or Chosen Peers

Moderated on the Agreement Between the Focal Engineer and the Same Individuals on the Job Duties

	Correlations with:					
	Supervisors Moderator: Similarity with Supervisor on Job Duties		Technical Peers Moderator: Similarity with Tech. Peer on Job Duties		Social Peers Moderator: Similarity with Social Peer on Job Duties	
	Dissimilar (N=14)	Similar (N=15)	Dissimilar (N=11)	Similar (N=13)	Dissimilar (N=10)	Similar (N=10)
Expectancy that:						
Low Effort -- Low Perf.	.52	-.30	-.07	-.31	-.04	-.39
Ave. Effort -- Low Perf.	-.39	-.39	.64*	.00	.63	-.14
High Effort -- Low Perf.	-.11	-.22	-.09	-.08	.30	-.17
Low Effort -- Ave. Perf.	.51	-.36	-.12	.65*	-.17	.33
Ave. Effort -- Ave. Perf.	-.46	-.29	.19	-.22	.06	.06
High Effort -- Ave. Perf.	.18	-.20	-.49	.42	-.50	.35
Low Effort -- High Perf.	-.11	.10	.73*	-.33	-.10	-.04
Ave. Effort -- High Perf.	-.02	.49	-.40	.15	-.47	.10
High Effort -- High Perf.	-.37	.59*	-.28	-.04	-.40	-.07
Instrumentality of Performance for:						
Pay	.71**	.14	-.20	.13	-.32	.44
Autonomy	.47	.21	-.59	.12	-.32	-.08
Security	.42	-.02	.15	-.10	.02	-.08
Recognition	-.22	.14	-.04	.44	.16	-.52
Promotion	-.12	-.36	-.65*	.63*	.55	.63
Friendships	-.28	.04	.30	-.22	.54	-.43
Feedback	-.02	-.13	-.25	.10	-.13	.35
Accomplishment	.46	.47	-.56	-.03	-.23	-.07
Free time off the job	.46	.18	-.08	.46	-.19	.47

Table 6: Correlations Between Focal Engineers and Their Supervisors or Chosen Peers

Moderated by the Focal Engineer's Time in Months in the Organization

	Correlations with:					
	Supervisors		Technical Peers		Social Peers	
	One Year or Less	More Than One Year	One Year or Less	More Than One Year	One Year or Less	More Than One Year
	(N=18)	(N=29)	(N=14)	(N=26)	(N=11)	(N-23)
Expectancy that:						
Low Effort -- Low Perf.	.27	.01	-.45	-.10	-.41	.05
Ave. Effort -- Low Perf.	-.20	-.26	.17	.21	.22	.28
High Effort -- Low Perf.	-.38	.24	-.47	.16	-.58*	.35
Low Effort -- Ave. Perf.	.21	-.36	.39	.32	.38	.16
Ave. Effort -- Ave. Perf.	.26	-.28	-.27	.21	-.19	-.03
High Effort -- Ave. Perf.	-.15	.30	-.39	.04	-.14	.03
Low Effort -- High Perf.	-.44	.04	-.67**	.41*	.00	-.12
Ave. Effort -- High Perf.	.29	.11	.41	-.29	.32	-.24
High Effort -- High Perf.	.03	-.13	.30	-.32	.43	-.25
Instrumentality of Performance for:						
Pay	.00	.12	-.07	.07	.13	.05
Autonomy	.31	.18	-.23	-.36	-.51	-.29
Security	.36	.21	.17	.02	.32	.12
Recognition	-.36	.07	-.02	.12	-.21	.08
Promotion	-.13	-.16	.22	.45*	.17	.51*
Friendship	-.11	-.31	-.24	.03	-.33	.42*
Feedback	.01	.03	-.20	.18	-.09	.13
Accomplishment	.29	.28	-.47	-.41	-.55*	-.27
Free time off the job	.28	.27	.16	.01	.36	-.08

* $p \leq .05$
** $p \leq .01$

Table 7: Correlations Between Focal Engineers and Their Supervisors or Chosen Peers

Moderated by the Focal Engineer's Time in Months in the Present Position

	Correlations with:					
	Supervisors		Technical Peers		Social Peers	
	Less Than One Year	More Than One Year	Less Than One Year	More Than One Year	Less Than One Year	More Than One Year
	(N=27)	(N=20)	(N=21)	(N=19)	(N=17)	(N=17)
Expectancy that:						
Low Effort -- Low Perf.	.24	-.16	.34	.02	-.37	.20
Ave. Effort -- Low Perf.	.03	-.44	.13	.25	.17	.33
High Effort -- Low Perf.	-.17	.21	-.11	.00	-.16	.41
Low Effort -- Ave. Perf.	.09	-.42	.49*	.24	.25	.17
Ave. Effort -- Ave. Perf.	.14	-.32	-.02	.13	-.06	-.11
High Effort -- Ave. Perf.	-.17	.46*	-.32	.11	-.18	-.02
Low Effort -- High Perf.	.07	.00	-.23	.54*	.05	-.32
Ave. Effort -- High Perf.	.40	-.02	-.04	-.26	.25	-.38
High Effort -- High Perf.	.01	-.20	.03	-.35		
Instrumentality of Performance for:						
Pay	0.09	.29	.12	.05	.26	.04
Autonomy	.31	.08	-.15	-.31	-.30	-.24
Security	.34	.15	.17	.01	.35	.16
Recognition	-.22	.00	.02	.26	.00	.21
Promotion	-.23	-.09	.48*	.50*	.53	.45
Friendship	-.15	-.27	-.15	.08	-.08	.44
Feedback	-.02	.02	-.19	.25	-.05	.19
Accomplishment	.34	.21	-.45*	-.39	-.48	-.28
Free time off the job	.17	.37	.07	.05	.09	.01

$\bar{X}_S = 3.87$, $\bar{X}_E = 2.86$), and Free time off the job ($t = 3.56$, $p \leq .01$; $\bar{X}_S = 1.17$, $\bar{X}_E = .34$). In all cases, those who had been with the company more than one year held lower instrumentalities for positively valent outcomes than did their supervisors. Those who had been there less than one year differed from their supervisors on none of the outcomes.

The same general pattern held up for instrumentalities for tenure in the current position although the results were not as strong. In this case, pay ($t = -.32$, $p \leq .01$; $\bar{X}_S = 3.35$, $\bar{X}_E = 2.18$), recognition ($t = -3.44$, $p \leq .01$; $\bar{X}_S = 4.50$, $\bar{X}_E = 3.00$), and promotion ($t = -3.00$, $p \leq .01$; $\bar{X}_S = 2.65$, $\bar{X}_E = 1.03$) were significantly different for longer tenured engineers and only pay ($t = -2.84$, $p \leq .01$; $\bar{X}_S = 3.55$, $\bar{X}_E = 2.56$) was significant for those on the job less than one year.

Comparisons between chosen peers and the engineers moderated on tenure showed little effect of tenure on either the correlations or the mean differences. When months with the organization was used as a moderator, only one of the expectancy measures showed a moderator effect for technical peers and one for social peers. For instrumentalities, only social peers had a moderated difference and this was only for one of the nine outcomes (Friendship). Mean differences occurred for two of the nine instrumentalities for technical peers and none were found for social peers. The two differences were on promotion for those with less than one year with the organization ($t = 2.11$, $p \leq .05$) and on promotion for those with one year or more on the job ($t = -2.19$, $p \leq .05$). Since one occurred for both the low and the high tenure groups, little evidence existed for a moderating effect.

A similar conclusion was reached when tenure on the present position was investigated as a moderator for technical and social peers. One mean difference existed for each group on instrumentalities with technical peers

(Recognition with high tenure, $\underline{t} = -2.44$, $\underline{p} \leq .05$; Promotion, $\underline{t} = 3.09$, $\underline{p} \leq .01$) and one for the expectancy that high effort led to low performance as seen by low tenure individuals ($\underline{t} = 2.09$, $\underline{p} \leq .05$). Thus, it was concluded that tenure only influenced the relationship between supervisor and focal person's perceptions of instrumentalities and expectancies.

Discussion

The focus of the present study was on the influence of several possible factors on individuals' perceptions of job characteristics relevant to work motivation. Specifically, expectancies and instrumentalities, both central concepts in Expectancy theory, were related to two sets of variables. The first set contained individual differences or demographic variables, and the second set was the perceptions of other individuals in the work setting who interacted frequently with the focal persons.

The only individual difference or demographic variable that related directly to expectancies and instrumentalities was that of tenure. The data implied that the longer a person was on the job or with the company, the less he believed that high performance on his job was influenced by changes in the amount of effort he put into it. With more experience, the subjective probability that high effort would lead to high performance decreased and the subjective probability that low effort would lead to high performance increased. Beliefs also changed on the extent to which valued rewards or outcomes would result from changes in performance. Five of the nine outcomes investigated in the study were seen to be less tied to performance as individuals had more experience with the company and/or their present job.

Although in the strictest sense correlational field studies without time lags in data collection cannot be used to draw causal inferences, the logical constraints surrounding the nature of the variables under consideration here make a causal interpretation more reasonable. With any correlation between two variables, a and b, either a causes b, b causes a, or they both covary with some outside variable which influences both of them. Given the relationship between job perceptions and tenure, changes in expectancies and instrumentalities could influence tenure only if unfavorable perceptions led individuals to quit the company or transfer out of the engineering division. Two factors militate against this conclusion. The first is that the engineering unit did not have a very high turnover rate. This was especially true for the twelve months preceding data collection. During that time period, national economic conditions were such that those on the job stayed there. Secondly, the observed relationship between perceptions and tenure was a negative one, indicating that those with longer tenure saw less possibility of obtaining desired states from their own efforts. Presumedly, such conditions were less attractive. Therefore, if perceptions were influencing tenure, they should have been decreasing the length of time people stayed by encouraging turnover. This did not occur.

The most likely explanation for the observed relationship is that tenure reflected the degree of experience with the job and the organization, and that this experience influenced perceptions. With more experience in the job setting, high performance was seen as less associated with how hard one works and rewards seen as less associated with performance. All-in-all, the effort was a problematic one from a motivational perspective. It indicated that the greater the experience on the job, the less the job was able to motivate the individual toput forth a high degree of effort and strive for high performance.

Given that expectancies and instrumentalities tended to drop with more experience on the job, the question arises as to whether this drop represented a more accurate view of the job's motivational characteristics or a less accurate one. Arguments have been made for both cases. Dachler and Mobley (1974) implied those who had been on the job longer were more accurate in their perceptions, and, as a result, the expectancy model was better able to predict their behavior. Hackman (1969) on the other hand, argued that individuals "redefine" their job as they gain more experience on it and this redefinition becomes more idiosyncratic and less dependent upon the actual job characteristics as seen by others not on his job.

The comparison of each engineer's expectancy and instrumentality perceptions with those of their chosen peers indicated that the perceptions were accurate. It will be recalled that there were no significant differences in the mean perceptual ratings between the focal engineers and either set of peers. Lacking any objective standard or basis on which to say what were the actual probabilities that effort would lead to performance and performance to outcomes, it was assumedthat, if all agreed on the probabilities, it was likely that the job did present the condition as rated.

To the extent that the instrumentalities and expectancies were accurate as they appeared to be, the discrepancies between the perceptions of the focal engineers and those of their supervisors become more problematic. It was found that, with expectancy estimates, supervisors and their subordinates tended to agree on most of them. There was some indication that the engineers believed low or average performance was more likely to result from higher levels of effort than the supervisors believed to be true, but when both supervisors and their subordinates' estimates were compared to a pattern of subjective probabilities optimal for high motivation, both groups were relatively similar.

Instrumentalities, on the other hand, were much less similar for the two groups. Considering the group as a whole, supervisors saw the contingency between performance and both salary and recognition as significantly stronger than did the engineers under them. More importantly, when the sample was divided on the basis of tenure with the organization, six of the nine outcomes considered as rewards in the present study were rated significantly more closely tied to performance by supervisors than by their subordinates. The same general pattern held up for tenure on the current position. This implies that as the engineers gained more and more experience with the organization and the job, their perceptions became more accurate and these perceptions became less similar to those of their supervisors. Furthermore, the new perceptions were ones which saw a lower contingency between performance and valued rewards and consequently should have decreased the degree to which the individuals would be motivated to perform highly.

The experience effects of lowering instrumentalities and creating a disagreement between supervisors and their subordinates on reward contingencies may be viewed in light of what Johnson (1975) described as stimulus versus reinforcement control over performance. New employees enter the work setting uncertain about what is required of them and seeking information about what behaviors are expected and rewarded (Ilgen, 1975; Porter, Lawler, Hackman, 1975). Since the supervisor is a central figure in the new employee's environment and also one who is most likely to control valued rewards, the new employee will, more than likely, rely heavily upon what he is told about his job by his supervisor. Furthermore, he may base his behavior upon the reward contingencies he is told by his supervisor. In this case, his behavior would be controlled by the stimulus of the supervisor's instructions or descriptions. If, through experience, the anticipated rewards do not result from behavior as the supervisor described them, a conflict exists between the stimulus and the reinforcement that follows from the behavior. When such conflict exists, Johnson showed that it is the reinforcement, not the stimulus, which controls the behavior. Therefore, the employee should readjust his instrumentality estimates in line with his experience and away from his supervisor the more he gains experiences which present him with conflicting feedback. The data of the present study suggest that such a mechanism operated.

The situation presented here is a perplexing one for the supervisor. It suggests that his view of the reward contingencies are most similar to his subordinate when his subordinate joins the group, but that they diverge as the subordinate gains more experience. For leadership models that stress the role of the leader as a motivator of his subordinates, such as that of House (House, 1971, 1973; House and Mitchell, 1974), this implies that the leader should be most effective in his influence attempts with new employees but his influence would decrease over time. Furthermore, to the extent that the superior believes that rewards are more contingent upon performance than do his subordinates (that is, he is unaware of their differences in perceptions), attempts to influence behavior through reference to the supposed contingencies may have two detrimental effects. First, any attempt to influence performance by referring to the reward contingencies will be less effective in changing employee behavior than the supervisor assumes they will be. Second, reference to contingencies which are obviously weaker than the supervisor states them to be may weaken his credibility among his subordinates. Obviously, from the supervisor's standpoint, efforts should be made to keep communications open and prevent the divergence of perceptions about motivational contingencies. Furthermore, since the contingency perceptions of subordinates decreased with experience, efforts should be made to maintain higher contingencies by more closely tying rewards to performance.

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